

Safety Begins At Home

How to Heat Your Home Efficiently and Safely





This ***Safety Begins At Home*** booklet was developed to provide tips on efficiently and, **most** importantly, safely heating your home.

No matter what type of fuel you use to heat your home and operate your appliances, these safety tips will help you manage your utility costs and heat your home safely and efficiently.

The information was prepared by the State of California Department of Community Services and Development (CSD) and Redwood Community Action Agency with information provided by the California Environmental Protection Agency, California Air Resources Board, Pacific Gas and Electric Company, Nichols' LP Gas Service, Inc., and the Oregon Department of Environmental Quality.

For more information about the tips in this booklet, check the websites below or call your local utility company.

**California Department of
Community Services & Development**
www.csd.ca.gov

**Oregon Department of
Environmental Quality**
www.deq.state.or.us

Redwood Community Action Agency
www.rcaa.org

Pacific Gas & Electric Company
(800) 743-5000

**California Environmental
Protection Agency**
www.calepa.ca.gov

Southern California Gas
(800) 427-2200

California Air Resources Board
www.arb.ca.gov

San Diego Gas & Electric
(800) 411-7343

Pacific Gas & Electric Company
www.pge.com

Southwest Gas
(800) 443-8093



TABLE OF CONTENTS

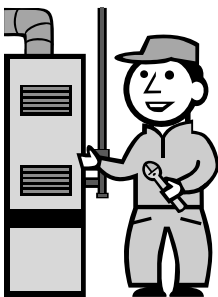
Safety Begins at Home

Heating with Natural Gas	1
Heating with Firewood	2-6
Heating with Propane	7-8
Heating with Electricity	9
Home Weatherization and Minor Home Repairs	10-11



Heating with Natural Gas .. Safely

- **Make sure** that your family knows what natural gas smells like. In its natural state, natural gas does not have a smell. However, a scent is added so that you can detect it when there is a leak.
- **Call** a gas service person to have the system checked if you smell natural gas when operating your gas appliances.
- **If you do smell gas, LEAVE** your house and call the gas company from a friend or neighbor's house. **DO NOT** call from your home as the electrical spark from your phone could ignite the gases and cause an explosion.
- **DO NOT** use a heater or water heater if it is not properly vented to the outside. Carbon monoxide could be spilling back into your home and poisoning your family.
- **DO NOT** use the oven or stove top burners to heat your home. This puts you at risk of carbon monoxide poisoning, burns from hot surfaces and it shortens the life of the appliance. Use only heaters that are designed for home heating and follow the manufacturer's operating instructions.
- **DO NOT** store paints, solvents, gasoline or other combustible materials in the same room or near your heater or water heater in areas such as a garage.
- **DO** install earthquake straps on your water heater to securely anchor it to wall studs. This will help prevent the heater from shifting and possibly falling during an earthquake.
- If your water heater is on an elevated platform, **make sure** the platform is sturdy enough to withstand the weight of the water heater and movement during an earthquake.



- **DO** keep all water heater vent pipes and air supply vents clear of obstructions and properly aligned.
- **DO** have your furnace serviced once a year to maximize its efficiency and to check for fire hazards, such as a damaged firebox or vents.
- **DO** install an appliance gas shutoff valve for each gas appliance that allows you to turn off the gas to that appliance if there is a gas leak or if the appliance needs to be replaced or serviced.
- **DO** make sure that the door that covers the pilot light and burner area is securely fastened.
- **DO** install a pressure relief valve on your water heater if it does not have one or if it is inoperable.



Heating with Firewood .. Safely

Knowing how to best operate your wood stove or fireplace can increase the efficiency of heating your home, and reduce fire hazards and air pollution. This brief summary of health and safety information and wood burning techniques will help you to improve the efficiency of your home heating.

What is in Wood Smoke?

Wood smoke is fuel from your firewood that does not burn and becomes air pollution. Smoke contains harmful gases and fine particles known as Particulate Matter made up of wood tars, gases, soot and ash. Unburned pollutants in wood smoke include:

- **CO - Carbon Monoxide** - reduces the blood's ability to supply oxygen to body tissues. Even small amounts can stress your heart and reduce your ability to exercise.
- **NOx - Oxides of Nitrogen** - which may lower a child's resistance to lung infections.
- **HC - Hydrocarbons** - which can injure the lungs and makes breathing difficult.
- **Particulates** - microscopic particles and condensed gasses that can lodge in your lungs and cause distress.

General Effects of Wood Smoke

Wood smoke contains tiny particles that are so small the body's natural defense mechanisms can't keep them from penetrating deep into the lungs. Once inhaled, these particles can become lodged in the lower lung tissue for weeks or years before being expelled. This can cause structural damage and chemical changes to the lung tissue and reduce resistance to infection.

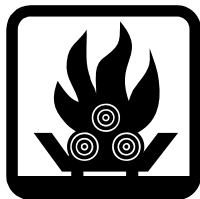
Most common health effects from wood smoke include congestion, headaches and itchy eyes. These fine particles can permanently damage lung tissue and can lead to serious respiratory problems including infections, bronchitis, emphysema and cancer. Wood smoke can also increase the severity of existing conditions such as asthma, heart disease and pneumonia. Those at high risk include children, people over 65 and those with chronic heart and respiratory problems.

Stages of Burning

You can achieve a cleaner and more efficient home heating process by following the tips below:

- **Evaporation** - The first stage of combustion is evaporation, when energy is expended to boil moisture from the wood. Using energy to drive off excess water in firewood robs the stove of energy needed for an efficient and clean burn. **Also, much of the energy wasted in evaporating water is energy that could have heated your home.** This is both energy and money wasted. See the tips below on using seasoned wood.
- **Emissions** - As heat inside the stove intensifies, waste-gases (smoke) are released from the wood. Smoke is emitted into the air as pollution or condensed in the chimney causing creosote build-up. Waste gases from wood need oxygen in order to burn. This is why starving a fire for air, or “banking down a fire” is the worst way to burn. **Always give a fire a generous supply of air.**
- **Charcoal** - When most of the tar and gasses have burned, the remaining substance is charcoal. A hot bed of coals can enhance the combustion process when burning larger pieces of wood. Start with a small fire to develop a bed of hot coals. As the coal bed develops and the stove heats up, slowly add larger and larger pieces of wood. **It takes time to build a good coal-bed, but it's worth the effort.**

Burn Only Seasoned Wood



- Unseasoned wood is hard to ignite and very inefficient. When logs are cut 50% of their weight is water. If wet when burned, high amounts of energy are wasted driving off excess moisture, resulting in very poor combustion, increased pollution and creosote build-up.
- The best fuel is dry, "seasoned" wood. Seasoned wood has a moisture content of about 20% or less. It tends to be dark in color, cracked on the ends, light in weight and has bark that is easily broken or peeled. Another option for an occasional fire is to use manufactured logs made of compressed sawdust.

Tips to Prepare Seasoned Wood

- **Split** the wood to help it dry. Wood will dry out more quickly and burn best if the wood is cut to about 3½ inches to 6 inches in diameter.
- **Cover** the split firewood to protect it from the weather and stack it loosely in alternating layers, at least 6 inches off the ground.
- **Time** must be given to allow the wood to reach 20% or less moisture required for seasoned wood. This process takes approximately 6-12 months. Think ahead and buy wood for the next winter well in advance.

Guidelines for Home Heating by Type of Wood

Species	Minimum Outdoor Drying Time	Heating Value Million Btu per Air-Dried Cord	Ease of Splitting	Sparks
Alder	Longer than 6 months	18-21 medium	easy	moderate
Cedar	6 months	14-20 medium-low	easy	many
Douglas Fir	6 months	19-21 medium	easy	moderate
Madrone	6 months	30 high	difficult	very few
Maple	6 months	19-21 high-medium	moderate	few
Oak	6 months	29-31 high	moderate	few
Pine	6 months	17 medium-low	easy	moderate
White Fir	6 months	17 medium-low	easy	moderate

Continued Safe & Clean-Burning Operation

Each year there are numerous home and chimney fires caused by burning wood. Periodically inspect your stove or fireplace to ensure its continued safe and clean-burning operation. Use the following checklist to troubleshoot possible problems during your inspection:

- **Check** the chimney cap as it may be plugged by debris which will reduce the draft.
- **Check** the catalytic combustor and baffles – they are exposed to very high heat and deteriorate as used. Replace every 1 to 4 years depending on use.
- **Check** stovepipe angles and bolts which are subject to corrosion and replace as needed.
- **Check** gaskets on airtight stove doors - they need replacement every few years. Gaskets and seals are very important as they are used by the appliance designer to control the location and flow of air into the appliance.
- **Check** seams on stoves sealed with furnace cement. Seams may leak and cause you to lose valuable heat and reduce the efficiency of the unit.
- **Check** for broken or missing firebricks which will need to be replaced.
- **Check** the grates and stove bottoms as they may crack or break. Keep the floor of your stove clean of debris and ash.

- **Remember** to have your chimney or flue pipe professionally cleaned and inspected at least once per year to remove creosote and to prevent a chimney or house fire. Lastly, follow the woodstove or chimney manufacturer's instructions carefully to maximize the efficiency of the unit.

Be a Good Neighbor

Use common sense and be courteous to your neighbors by reducing your smoke as much as possible. Remember smoke from just one chimney means that your wood is not burning efficiently and this can cause significant pollution problems in your neighborhood. If you see smoke, adjust your dampers or air inlets and let in more air. The darker the smoke - the more air pollutants it contains and the more money you are wasting.



Problem Fire = Thick Column of Smoke

Smoke Signals



Good Fire = Only Heat Waves are Visible

Formula for Good Burning:

1 part dry, seasoned wood
 + 1 part safely operating equipment
+ 1 part the right amount of air
 = Good Fire

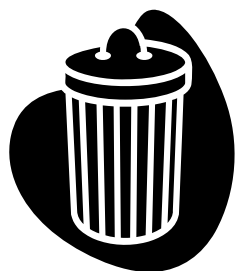
Let the Fire Breathe

- Build small, hot fires instead of large, smoldering ones. A good rule of thumb is to keep your stove no more than half full and to provide ample air supply for efficient combustion. Arrange the wood in your stove to leave spaces and gaps between pieces for good air circulation.
- Do not close the dampers or air inlets too tightly as it will cause the fire to smoke from a lack of sufficient air supply.

Do Not Burn Overnight Fires

- A smoldering fire results in substantial quantities of air pollution and wastes wood and money. You lose efficiency, costing you more money and providing you with less heat. Overnight fires are also a major fire hazard! When using an open fireplace, **DO NOT** allow a fire to burn overnight, unattended, as it can lead to a back draft of smoke into your home, causing dangerous gases to escape into your home.
- Check with your local Fire Department to learn more about fire hazards and safety!

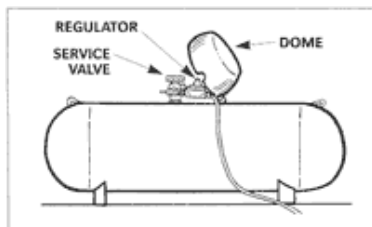
No Garbage Please!



- Burn only clean, dry, seasoned wood in your wood stove or fireplace. Do not burn materials such as garbage, plastics, rubber, paint, oil, charcoal briquettes, and glossy or colored paper. Burning garbage in your wood stove or fireplace can be toxic and extremely harmful to you, your family and others in your neighborhood. These toxins can also foul your catalytic combustor and flue which will cost you money in lost efficiency and repair costs.

Consider Other Alternatives

- Consider switching to a cleaner and more efficient heating source such as a U.S. EPA-certified woodstove, natural gas, oil or propane. Additional ways to reduce your overall heating needs include: installing ceiling, floor and attic insulation; sealing plumbing cracks and holes in the building; weatherstripping doors and windows; and installing a ceiling fan to circulate the warm air around the room and throughout the house.
- **Conservation and weatherization are the cheapest ways to cut home heating costs.**
- **To find out if you qualify for the FREE LIHEAP weatherization program, contact the Department of Community Services and Development at (866) 675-6623 for information on how to locate the service provider in your area.**



Heating with Propane .. Safely

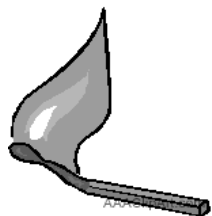
Gas Safety Check

If your home has a propane furnace, water heater, range or other conveniences, you should schedule a gas check of your whole propane system, including the appliances, at least annually. Your local propane gas supplier will send a specially trained service technician to check your system for leaks and ensure that it meets all applicable safety standards. The technician will also check your tank, piping, regulators, gauges, connectors, valves, vents, thermostats, pilots, burners and appliance controls to make sure they are in good working condition.

Children and Safety

- Parents should make sure children who are home alone know the rules of gas appliance safety. Let your children know what typical noises your furnace, water heater or refrigerator can make. They will be less fearful on their own if they know that your water heater normally gurgles or the furnace sometimes creaks and pops.

Parents and children should consider following these simple safety rules:



- Children should not turn on propane gas appliances without parental supervision.
- Families should keep papers, clothing and toys away from furnaces, space heaters and gas fireplaces.
- Children should stay away from propane storage tanks and shut-off valves.
- Naturally odorless, propane gas has a rotten-egg smell added to it to help identify any leaks. Make sure your child recognizes the smell by using a scratch and sniff brochure available from your propane supplier. Tell your children if they smell gas, they should leave the home right away, **without using the telephone, any electric switches or appliances.** Children should go to a trusted neighbor's home for help, and call mom or dad or the fire department from that location – not their home. The electrical spark from your phone could ignite the gases and cause an explosion.

Weather Related Emergencies

Follow these basic safety precautions to protect your family and property before and after a weather related emergency:

- Properly secure the propane tank, if possible.
- Turn off the gas supply valve at the tank.
- Fasten the protective dome on the tank.
- Turn off pilot lights, control valves and manual shut-off valves.
- After the emergency has passed, look for visible structural damage.



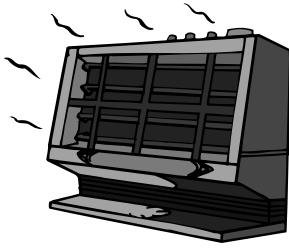
Call your propane dealer or a qualified technician if:

- You smell propane gas.
- Your propane tank has shifted or moved.
- The gas lines are damaged or pulled away from the tank or appliances.
- Propane appliances or their controls have been exposed to water.

Additional Home Heating Safety Tips

- **DO NOT** use a propane or kerosene heater, or other type of unvented heater in your home as they present a serious health and fire hazard.
- Always follow the instructions in the owner's manual of your heater to ensure the proper operation of the appliance and help maximize its lifetime.

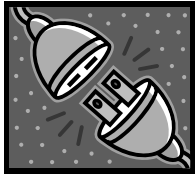




Heating with Electricity .. Safely

Electric Heaters

- **Use** only appliances with the Underwriters Laboratories Inc. (UL) symbol. This symbol shows that the product has been safety-tested.
- **Use** extension cords with three-pronged plugs for appliances that require grounding such as electric heaters.
- **DO** put safety covers over unused electric outlets and never let children play around outlets.
- **DO NOT** use an electric heater with a cord that is broken, frayed, damaged, tied in knots or that has melted insulation.
- **DO NOT** hang clothes to dry on or near your electric heater, heating vent or hot plate.
- **DO NOT** place furniture and blankets close to electric heaters or hot plates.



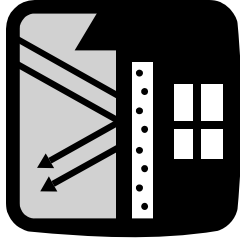
- **DO NOT** place electric cords under rugs or where they can be walked on and damaged. You might not see the damage that could cause a fire and harm your family.
- **DO NOT** touch the metal prongs of a cord when plugging in an appliance.
- **DO NOT** overload outlets with too many lamps or appliances.

Electricity and Water

Electric appliances and water can cause a severe electric shock and possibly death.



- **DO NOT** use electrical appliances such as radios, televisions and hair dryers near sinks, toilets or bathtubs.
- **DO** make it a habit to always dry your hands before handling electric appliances and cords.
- **DO** make sure to keep the floor around you clean and dry when using electrical appliances, tools or equipment.
- **DO** make sure to unplug small appliances when washing them.



Weatherization and Minor Home Repairs

The State of California Department of Community Services and Development, in cooperation with its network of local community-based service providers, offers free energy efficiency and minor home repair services for income-qualified households.

The weatherization services are designed to improve the energy efficiency of the home and to reduce energy usage and costs while safeguarding the health and safety of the household.

Typical weatherization services designed to protect your home and lower your energy use include:



- Caulking cracks and sealing plumbing penetrations to reduce air infiltration and heat loss.



- Weatherstripping doors and windows to reduce air infiltration.
- Insulating ceilings, floors, water heaters and heating ducts to keep the heat in and the cold air out. This saves you money on home heating.



- Testing and repair or replacement of combustion appliances such as heaters, cook stoves and wood stoves to ensure safe operation and to prevent carbon monoxide poisoning.



- Replacing old, expensive-to-operate refrigerators with new Energy Star rated refrigerators.

Minor Home Repairs

Local agencies also provide essential health and safety-related minor home repairs as part of the weatherization process to keep occupants safe and to ensure the most efficient use of home heating.



Minor home repairs include:



- Glass and/or window repair or replacement.

- Door repair or replacement to improve health and safety conditions and to prevent drafts.
- Repairs to siding and other building components to reduce heat loss, improve the efficient use of energy and to improve home safety conditions.



February 2006

Safety Begins at Home was printed on recycled paper containing 30 percent postconsumer fiber. 